REMARKS

Claims 1, 3, and 4 are pending. Claim 5, identical in subject matter to claim 4 is being added. Claim 2 is being canceled and the subject matter thereof added to Claim 1. Both claims 1 and 3 are being amended to have the surface roughness be Ra 17 which is clearly supported in Example 1 set forth in Table 2 of the application. No new matter is being added. Applicants respectfully rejoinder and examination of withdrawn claim 4, which depends from claim 1, together with Claim 5, which are allowable at least for the reasons discussed below.

The Office Action rejects claim 1 under 35 U.S.C. 103(a) as being obvious over Mitamura et al. (U.S. Patent No. 4,157,728). The Office Action somewhat similarly rejects claim 2 under 35 U.S.C. 103(a) as being obvious over Mitamura et al. in view of Igarashi (U.S. Patent No. 2,166,496) and claim 3 under 35 U.S.C. 103(a) as being obvious over Mitamura et al. in view of "Aluminum and Aluminum Alloys, p. 88-89). These rejections are traversed, as they may apply to the amended claims.

The present invention is directed to "[a]n aluminum alloy billet as cast for forging, obtained by a continuous casting process, the alloy comprising: **a surface of which roughness is not more than Ra 17**, and a segregation layer having 0.2 to 2 mm thickness and generated in the surface," with claims 1 and 3 differing in the addition of another alloying material.

As the Office Action notes, "Mitamura does not mention the alloys' surface roughness is not more than Ra 35" (see the first sentence in the first full paragraph on page 3 of the Office Action).

However, the Office Action asserts that "Mitamura teaches an aluminum alloy processed in a substantially similar method, then substantially the same properties, such as surface roughness, is also expected to occur" (see the last sentence in the first full paragraph on page 3 of the Office Action).

However, Applicants respectfully submit that Mitamura does not teach a substantially similar method.

As explained in paragraphs [0017]-[0019] of the present specification, "[t]he inventors found that it is important to use an effect of the stable oxide film formed in the solidification process and the elasticity of the half solidified portion in order to ensure a smoothness of the cast surface in the heat insulating mold continuous casting process. In particular, the casting rate is controlled such that the solidification interface m of the aluminum alloy material is positioned inside the mold 2 away from the discharge edge 2b, as shown in Fig. 1B. The solidification interface m can be formed at any position of the tapered portion in the discharge opening 2a. By controlling the casting rate in the above-mentioned manner, the solid-liquid coexistence area M2 protected by the oxide film S and having excellent elasticity is smoothly extracted from the mold 2 without breaking the oxide film S by edge 2b, and a smooth cast surface is therefore obtained. The diameter of a casting bar is smaller than the diameter of the edge 2b (the diameter of the lowermost portion of the discharge opening). However, there is no problem by properly setting the casting rate and the size of the mold according to the production level. It is desirable that the solidification interface be controlled, as much as possible, to a position in the vicinity of the edge 2b. According to such control, the material can

be cooled quickly and the crystal grains can be made fine...The present invention provides a continuous casting process for an aluminum alloy material for forging, the process comprising: charging a melted metal consisting of the aluminum alloy material into a mold at a predetermined casting rate, the mold having a discharge edge through which the solidified aluminum alloy material is discharged; and controlling the casting rate such that a solidification interface of the aluminum alloy material is positioned inside the mold away from the discharge edge. ..... The aluminum alloy for forging in the present invention may be preferable produced by the above process. An aluminum alloy in the present invention may be selected from the group consisting of 2000 system, 3000 system, 4000 system, 5000 system, 6000 system and 7000 system alloys. A coarse recrystallization structure, which has been a conventional problem, is inhibited by a pinning effect as the amount of impurities becomes large. According to the present invention, the segregation layer, which has been known to be disadvantageous, is a material for inhibiting the formation of coarse recrystallization grains. Therefore, a material having a stable oxide film, generated in a surface layer, and having high fatigue strength under stress in a range from an intermediate degree to a low degree can be obtained. As a control process of the casting rate in the present invention, it may be mentioned to repeatedly perform acceleration and deceleration such that a solidification interface of the aluminum alloy material is positioned inside the mold away from the discharge edge instead of fixing the casting rate. According to the control of the casting rate, the position of the solidification interface always varies, and a smooth surface can be obtained consistently. Fig. 2 shows casting rate graphs of the

invention and a conventional technique. By controlling the casting rate as in the invention, the solidification interface moves slightly, so that adhesion between the aluminum alloy and the mold can be inhibited, and a smooth cast surface may be obtained."

Mitamura et al. does not teach or suggest any of the above-discussed aspects of the method used to prepare the presently claimed billet having a surface of which roughness is not more than Ra 17. Mitamura et al. only discloses "applying a gas pressure to the metals from directly below the overhang of a feed reservoir for receiving a melt to be cast...[and] supplying a lubricating oil from a slit for conveying the gas to the inner wall of the mold" (see the Mitamuara et al. abstract).

Thus, Mitamura et al. does not teach (or suggest) an aluminum alloy processed in a substantially similar method to that of the presently claimed billet. Therefore, substantially the same properties, such as surface roughness, would not necessarily be expected to occur.

The applicants hereby submit a Declaration under 37 C.F.R. § 1.132 proving that Mitamura does not have the claimed surface roughness. As shown in the Declaration, in Test 1 in which the casting rate is not constant and is repeatedly increased and decreased from 150 mm/min, the surface roughness of the produced billet was Ra 17. In contrast, in Test 2, although the casting rate was lower than that of Test 1, the surface roughness was Ra 32 since the casting rate is constant. Therefore, the aluminum alloy for forging disclosed in Mitamura does not have a smooth surface with a

surface roughness of not more than Ra 17. This also readily apparent from comparing Figures 17 to 19 in Mitamura with Figure 7A of the application.

It should be noted that the present invention is practically used as a material for a front suspension arm of a car now being sold in the US. The aluminum alloy billet as cast in the present invention is forged into the suspension arm without peeling the billet. The applicants strongly assert that such a production process has not been possible using conventional aluminum alloy billets as cast.

Thus, for at least the above reasons, the presently claimed invention would not have been obvious over Mitamura et al.

Neither of the secondary references cure the above noted deficiency of Mitamura.

Clear differences exist between the present invention as claimed and the prior art relied upon by the Examiner. It is submitted that these differences are more than sufficient that the present invention as claimed would not have obvious over such prior art.

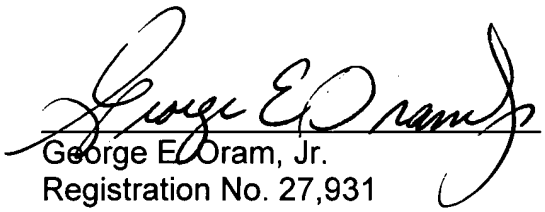
Therefore, reconsideration and withdrawal of the rejections of Claims 1 and 3 under 35 U.S.C. 103(a) are respectfully requested. Rejoinder of Claim 4 and the addition of Claim 5 are also requested.

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone

number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any additional fees may be charged to Counsel's Deposit Account 01-2300, **referencing attorney docket number 108421-00076**.

Respectfully submitted,



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Enclosure: Declaration of Yushi AMAKI under 37 C.F.R. § 1.132